

Amendment
Serial No. 10/825,816

IN THE CLAIMS:

1. (Currently Amended) A gain-clamped semiconductor optical amplifier comprising:
a gain waveguide for amplifying an optical signal input to the gain waveguide; and
a grating layer having a first and second gratings, the first grating on disposed at a first end portion of the grating layer, the first grating being disposed at a first end portion and the second grating disposed at a second end portion of the grating layer,
wherein the gain waveguide is disposed on the grating layer in a direct contact with the first grating and the first and second gratings have reflection factors different from each other.
2. (Canceled)
3. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 1, further comprising a clad laminated on the gain waveguide.
4. (Canceled)
5. (Currently Amended) ~~The gain-clamped semiconductor optical amplifier as claimed in claim 1.~~ A gain-clamped semiconductor optical amplifier comprising:
a gain waveguide for amplifying an optical signal input to the gain waveguide; and
a grating layer having a first grating disposed at first end portion of the grating layer,
wherein the gain waveguide is disposed on the grating layer in a direct contact with the first grating and the gain waveguide includes a mode conversion region formed at one end

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portion of the gain waveguide, the mode conversion region having a width which becomes narrower or wider as it goes to an end adjacent to the semiconductor optical amplifier.

6. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 5, wherein the mode conversion region is not in contact with the first grating.

7. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 5, wherein the mode conversion region is in contact with a portion of the first grating.

8. (Currently Amended) The gain-clamped semiconductor optical amplifier as claimed in claim[[2]]1, wherein the gain waveguide includes mode conversion regions formed at both sides of the gain waveguide, the mode conversion regions having a width which becomes narrower or wider as it goes to a corresponding end of the semiconductor optical amplifier.

9. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 8, wherein the mode conversion regions are not in contact with the first and the second gratings.

10. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 8, wherein each of the mode conversion regions are in contact with a portion of a grating adjacent to the mode conversion region.

11. (Currently Amended) ~~The gain-clamped semiconductor optical amplifier as claimed in claim 1.~~ A gain-clamped semiconductor optical amplifier comprising:

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a gain waveguide for amplifying an optical signal input to the gain waveguide;
a grating layer having a first grating disposed at a first end portion of the grating layer;
and
non-reflection layers disposed on two portions of the semiconductor optical amplifier,
wherein the gain waveguide is disposed on the grating layer in a direct contact with the
first grating~~further comprising non-reflection layers disposed on two portions of the~~
~~semiconductor optical amplifier.~~

12. (Canceled)

13. (Original) ~~The gain-clamped semiconductor optical amplifier as claimed in claim 1,~~
~~further comprising:~~

~~— a non-reflection layer disposed on a first end surface of the semiconductor optical amplifier, the first end surface serving as an input/output side of the semiconductor optical amplifier; and~~

~~— a high-reflection layer disposed on a second end surface of the semiconductor optical amplifier.~~ A gain-clamped semiconductor optical amplifier comprising:

a gain waveguide for amplifying an optical signal input to the gain waveguide;

a grating layer having a first grating disposed at a first end portion of the grating layer;

a non-reflection layer disposed on a first end surface of the semiconductor optical amplifier, the first end surface serving as an input/output side of the semiconductor optical amplifier; and

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a high reflection layer disposed on a second end surface of the semiconductor optical amplifier.

wherein the gain waveguide is disposed on the grating layer in a direct contact with the first grating.

14-17. (Canceled)